Claims

1. Data network implemented by a first network level (104) having a first addressing scheme and at least a second network level (108) having a second addressing scheme each network level provides connectivity over at least one network domain, the data network is **characterised in** that a first group of Network Resource Managers, NRMs, (b-d)) is arranged to control the resources of the first network level and a second group of NRMs (e-g) is arranged to control the resources of the second network level, wherein the NRMs of the first group (b-d) and second group (e-g) comprise means for communicating on a common network level and for exchanging resource requests by using the first addressing scheme, wherein the NRMs (e-g) of the second group further comprise means for performing an address mapping between the first and second addressing schemes.

2. Data network according to claim 1, wherein the first network level is the Internet Protocol, IP, layer.

3. Data network according to any of claims 1-2, wherein the second network level is a link protocol layer.

4. Data network according to claim 2, wherein the second network layer is a second protocol layer controlling an overlay network on top of said IP layer.

5. Data network according to claim 2, wherein the second network layer is a second IP layer controlling an overlay network on top of said IP layer.

6. Data network according to claim 5, wherein it further comprises a third network level having a third addressing scheme, the resources of said third protocol layer is controlled by a third group of NRMs comprising means for exchanging resource requests with NRMs of the first network level using the first addressing scheme.

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7. Data network according to any of claims 1-6, wherein the NRMs of the third group further comprise means for performing an address mapping between the first and third addressing schemes.

8. Data network according to claim 6 when dependent on claim 3, wherein the third network layer is a third protocol layer controlling an overlay network on top of said IP layer.

9. Data network according to claim 6 when dependent on claim 3, wherein the third network layer is a second IP layer controlling an overlay network on top of said IP layer.

10. Data network according to claim 6 when dependent on claim 3, wherein the third network layer is a third protocol layer controlling an overlay network on top of said IP layer.

11. Data network according to claim 6 when dependent on any of claims 4-5, wherein the third network layer is a link protocol layer.

12. Data network according to any of claims 1-10, wherein the NRMs within at least one of said groups are arranged in a hierarchical structure arranged to communicate with each other.

13. Data network according to any of claims 1-11, wherein each of the NRMs is a logically centralised unit in a network.

14. Data network according to claim 12, wherein said logically centralised unit is distributed or backed up over several physical servers

15. Data network according to any of claims 1-13, wherein the data network in at least one of the network levels comprises a Network Controller (NC) comprising means for receiving a request from an NRM and means for obtaining detailed information such as topology maps, traffic measurement information, alarms of the network domain that is controlled by said NRM in response to said request.

16. Data network according to claim 14, wherein the data network in at least one of the network levels comprises a Device Controller (DC) comprising means for receiving a request from the NC and means for controlling vendor specific node technologies in response to said request.

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17. Data network according to claim 15, wherein the DC is co-located with the NC in at least one of the network domains.

18. Method in a data network implemented by a first network level having a first addressing scheme and at least a second network level having a second addressing scheme each network level provides connectivity over at least one network domain, the method is **characterised in** that it comprises the steps of:

-*controlling* (201) the resources of the first network level by a first group of Network Resource Managers, NRMs, and

-*controlling* (202) the resources of the second network level by a second group of NRMs, wherein the first group and the second group of NRMs comprises means for communicating on a common network level,

-*exchanging* (203) resource requests between NRMs of the first and second group by using the first addressing scheme, and

-*performing* (204) an address mapping between the first and second addressing schemes.

19. Method according to claim 18, wherein the first network level is the Internet Protocol, IP, layer.

20. Method according to any of claims 19, wherein the second network level is a link protocol layer.

21. Method according to claim 19, wherein the second network layer is a second IP layer controlling an overlay network on top of said IP layer.

22. Method according to claim 19, wherein the second network layer is a second protocol layer controlling an overlay network on top of the IP layer.

23. Method according to any of claims 18-22, wherein the data network further comprises a third network level having a third addressing scheme and the method comprises the further step of:

-*controlling* the resources of said third protocol layer by a third group of NRMs and

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-*exchanging* resource requests between any of the NRMs of the first and second network level using the first addressing scheme.

24. Method according to claim 23, wherein it further comprises the step of: performing an address mapping between the first and third addressing schemes.

25. Method according to claim 24 when dependent on claim 19, wherein the third network layer is a third protocol layer controlling an overlay network on top of the IP layer.

26. Method according to claim 24 when dependent on claim 19, wherein the third network layer is a second IP layer controlling an overlay network on top of said IP layer.

27. Method according to claim 24 when dependent on any of claims 20-21, wherein the third network layer is a link protocol layer.

28. Method according to any of claims 18-27, wherein the NRMs within at least one of said groups are arranged in a hierarchical structure arranged to communicate with each other.

29. Method according to any of claims 18-28, wherein each of the NRMs is a logically centralised unit in a network.

30. Method according to claim 29, wherein said logically centralised unit is distributed or backed up over several physical servers

31. Method according to any of claims 18-30, wherein the data network in at least one of the network levels comprises a Network Controller (NC), wherein the method comprises the further steps of:

-*receiving* by the NC a request from an NRM and

-*obtaining* detailed information such as topology maps, traffic measurement information, alarms of the network domain that is controlled by said NRM in response to said request.

32. Method according to claim 31, wherein the data network in at least one of the network levels comprises a Device Controller (DC), wherein the method further comprises the step of:

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-*receiving* by the DC a request from the NC and

-*controlling* vendor specific node technologies in response to said request.

33. Method according to claim 32, wherein the DC is co-located with the NC in the at least one of the network domains.

34. A computer program product directly loadable into the internal memory of a computer within a router or a server in a data network, comprising the software code portions for performing the steps of any of claims 18-33.

35. A computer program product stored on a computer usable medium, comprising readable program for causing a computer, within a router or a server in a data network to control an execution of the steps of any of the claims 18-33.

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